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Predictors of Reading Success for Hispanic Children Learning to Read in English

Graduate Thesis/Project

Submitted to the Faculty

Of the School Psychology Program

College of Liberal Arts  
ROCHESTER INSTITUTE OF TECHNOLOGY

By

Therese A. Lawson

In Partial Fulfillment of the Requirements  
for the Degree of  
Master of Science and  
Advanced Graduate Certificate

Rochester, New York

August 21, 2006

Approved: S. B. Graney  
(committee chair)

Name Illegible  
(committee member)

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Running head: READING SUCCESS FOR HISPANIC CHILDREN

Predictors of Reading Success for Hispanic Children Learning to Read in English

Therese A. Lawson

Rochester Institute of Technology

### Abstract

The utility of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) for documenting the reading progress of English Language Learners (ELLs) was investigated. Relationships among the DIBELS measures were explored using a correlational matrix. The predictive validity of the DIBELS for determining later literacy outcomes was assessed via a series of step-wise regressions. Results suggest that the DIBELS are valid for assessing the reading progress of Spanish-speaking ELLs. Growth was seen on all measures and established DIBELS benchmarks were generally met on time. Differing from previous findings, PSF did not positively correlate with NWF for first graders, and only fall PSF significantly correlated with later ORF. PSF may not be a valid indicator of future literacy success for Spanish-speaking ELLs. Results suggest that LNF may be a better indicator and that bilingualism may facilitate phonemic awareness.

The Hispanic population of the United States has grown rapidly in recent years. Between 1990 and 2000, the number of Hispanics living in the United States increased by 58% (Reid, 2001), resulting in this group being the “majority minority.” As of July 1, 2003, the estimated Hispanic population of the United States was 39.9 million, a figure which is expected to increase to 102.6 million by 2050 (U.S. Census Bureau, 2004).

Such population growth has important implications for the educational system. Hispanic students are increasingly enrolled in U.S. schools. Sixty-three percent of the 8.5 million Hispanic families in the United States have children under the age of 18 years old, with many of these children speaking Spanish as a first language (U.S. Census Bureau, 2004). Although a growing Hispanic population broadens the diversity of the typical classroom (Reid, 2001), education may pose the greatest challenge (Hardy, 2004). The educational system must be ready to meet the needs of these students, who have a different language background and are three times more likely than their Caucasian peers to drop out of school. The formation, by presidential order, of the Advisory Commission on Educational Excellence for Hispanic Americans highlighted the magnitude of this challenge. In an effort to close the educational achievement gap, the commission was charged on October 12, 2001 to develop a plan of action which would address the educational needs of Hispanic Americans. The resulting recommendations included setting high expectations for all Hispanic students along with full inclusion in the No Child Left Behind Act (President’s Advisory Commission, 2003). No Child Left Behind stresses increased accountability, while requiring that all third graders read proficiently by the year 2014 (Silliman, Wilkinson & Brea-Spahn, 2004). The need for effective literacy instruction is magnified by the fact that 75% of the 10 million English-language-learners

in U.S. schools are Spanish-speaking (Zecker, 2004), while 47% of total Limited English Proficient (LEP) students are in grades K-3 (Kindler, 2002).

### *Assessment of Reading Achievement*

To ensure that all children successfully acquire literacy skills, measures of reading achievement are needed. Commercially developed, standardized measures of reading achievement are widely available and used in the schools. Although such measure provide information about one's global standing compared to a national sample of same-aged peers, severe limitations hinder their usefulness for documenting individual progress. For example, these tests cannot be administered frequently given practice effects and few alternate forms. They are also expensive to administer and long in duration, making them inappropriate as early screening measures intended to identify "at-risk" readers. Finally, the need to sample skills across several years of curriculum results in scant diagnostic information and lack of sensitivity to small changes in reading ability (Fuchs & Fuchs, 1999).

In an era of increased accountability and No Child Left Behind, schools cannot wait for students to fail to become literate before they intervene. There is a need to document reading competence and growth in a "time-efficient, instructionally relevant" manner (Good, Simmons, & Kame'enui, 2001, p. 259). If struggling readers are identified, interventions can be put into place. Curriculum Based Measurement of Reading (R-CBM) provides a solution to the problems encountered with standardized tests. As multiple versions of these measures are available, they can be administered frequently to monitor reading growth. Administration is also quick and inexpensive. R-CBM provides an indicator of general reading competence by directly measuring oral reading fluency; the combination of reading accuracy and speed. Students are given single-page reading passages, or probes, developed from grade-level materials. Each probe is read

aloud for 1 minute, while the examiner notes errors. The score is the number of words the student read correctly per minute. Numerous studies have documented the reliability and validity of R-CBM (Elliot, Lee, & Tollefson, 2001; Fuchs & Deno, 1991; Fuchs & Fuchs, 1999; Markell & Deno, 1997). Oral reading fluency has been shown to correlate with performance in English and social studies (Fewster & MacMillan, 2002), as well as achievement levels on various state assessments. Of 198 third-grade students who attained the May of third grade oral reading fluency goal, 96% performed at or above expected levels on the Oregon Statewide Assessment (OSA) – Reading and Literature. Furthermore, CBM oral reading scores explained 45% of the variance in OSA scores (Good, Simmons, & Kame'enui, 2001). Similar correlations have been found between oral reading fluency and statewide reading assessments given in Arizona and Colorado (Shaw & Shaw, 2002; Wilson, 2005).

Although R-CBM is useful for progress monitoring and intervention with students who have begun to read, a floor problem limits its usefulness in the early grades (Fuchs & Fuchs, 1999). Beginning readers, that is those students with little or no prior literacy instruction, may achieve a score of zero because they are not yet able to read words. For these students, a measure is needed which taps the pre-literacy skills associated with successful reading acquisition.

Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminski, 2002) may be conceptualized as a downward extension of R-CBM (Elliot, Lee, & Tollefson, 2001). Like R-CBM, the DIBELS are defined as “indicators” of growth. Although not exhaustive of all pre-reading skills, the DIBELS provide an indication of literacy “well-being” (Kaminski & Good, 1996). Benchmark goals, or levels of proficiency suggestive of adequate progress and future reading success, are provided for each DIBELS component. Children who attain the



benchmarks by the end of kindergarten generally become average-level readers in first grade (Langdon, 2004). Drawing on previous reading research, the DIBELS involve tasks requiring phonological awareness and knowledge of letter names and sounds.

### *Phonemic Awareness and Reading*

Much research on the determinants of successful literacy acquisition has focused on phonological awareness, or one's knowledge of the sounds in spoken language. This knowledge may be conceptualized as falling on a continuum. Initially, a child is aware of clusters of sounds. As the child becomes older, however, phonological awareness becomes increasingly specific. Eventually, he or she must learn phonemes, or the relationship between each individual letter and its sound (Troia, 2004). Usha Goswami (2000) suggests that phonological awareness is a progression from the syllable level, to the onset-rhyme level, to finally the phoneme level. While syllable and onset-rhyme awareness can be seen in preschoolers, phonemic awareness is thought to develop when a child learns letters and begins to read. In reviewing the literature to date, Goswami points out that children as young as four correctly tapped out the syllables in a given set of words, but could not determine the phonemes in the words. Similarly, 4 and 5-year-olds had difficulty determining shared sounds when these were phonemes occurring at the end of non-rhyming words (Ex: tap, cup). Such difficulties were not found in 6-year-olds who had begun reading, however.

Phonological awareness is important to reading in that it allows children to realize that words are made up of individual sounds. With this awareness, children can then make sense of phonics, or matching letters to sounds. Phonics, in turn, allows one to read unfamiliar and/or low frequency words. By saying the sounds for each letter, a pronunciation is obtained which can then be compared to a verbal lexicon, or "store of words held in memory" (Ehri, 1991, p. 384).

Stanovich and Siegel (1994) propose that poor reading acquisition and reading disabilities result from a phonological-core deficit which is independent of IQ. In their study, the performance of children with reading disabilities as compared to their non-disabled peers was evaluated. Two groups of poor readers across grade levels, those with an aptitude-achievement discrepancy and those without a discrepancy, were compared to a group of average readers with no aptitude-achievement discrepancy. All groups were administered the Pseudoword Spelling and the Pseudoword Reading subtests of the Goldman, Fristoe, and Woodcock (1974) Sound Symbol Test, the Word Attack subtest of the Woodcock Reading Mastery Tests, pseudoword pronunciation tasks, phonological choice and pseudoword recognition tasks, and various measures of orthographic coding skill. Results indicated that older children reading below grade level performed worse on the pseudoword reading and spelling measures than younger children with average reading ability. No significant differences were noted for poor readers with an aptitude-achievement discrepancy, as opposed to poor readers without a discrepancy. Stanovich's and Siegel's hypothesis is further supported in the research findings of Hester and Hodson (2004), who noted no significant correlation between reading decoding and nonverbal intelligence, as assessed by the Test of Nonverbal Intelligence-3.

The phonemic awareness deficits of poor readers, however, have been substantiated in studies involving phonemic segmentation, decoding, and reading fluency. Tunmer and Nesdale (1985) administered measures of digraph (pairs of letters which do not correspond to the sound they make, for example "kn" as in "know") and nondigraph word segmentation, real word and pseudoword decoding, and reading comprehension to a sample of 63 first-grade students. Nondigraph word segmentation was significantly correlated with both pseudoword decoding and reading achievement. No students who failed to achieve the cut-off score on the nondigraph

segmentation task passed the decoding task. Phonemic segmentation appeared to be a necessary but insufficient pre-requisite for reading, however, as some students who demonstrated good phonemic segmentation skills performed poorly on measures of decoding.

Similarly, Hester and Hodson (2004) found performance on a phonological manipulation task to significantly predict reading decoding. Third-grade students who had difficulty using Pig Latin on short phrases and words varying in length from one to five syllables also had lower scores on the Word Attack subtest of the Woodcock-Johnson Tests of Achievement. A multiple regression analysis showed that 42% of student variance in Word Attack Scores could be accounted for by scores on the manipulation task.

Nonword reading and phonological skills have also been shown to account for a large percentage of the variance in word recognition skills. Nation and Snowling (2004) conducted a longitudinal study of 72 children. Each child was initially assessed at a mean age of 8.5 years and then reassessed 4.5 years later. At the time of the initial assessment, nonword reading and phonological skills accounted for 72% of the variance in word recognition. In turn, word recognition at Time 1 accounted for approximately 60% of the variance in later word recognition skills as assessed at Time 2.

### *Rapid Automatic Naming and Reading*

In addition to phonological awareness, the relationship of rapid automatic naming (RAN) ability to reading achievement has been investigated. In RAN tasks, students are provided with pictures of objects or letters which they then name under time constraints. Several studies (Badian, 1993; Badian, 1994; McCormick & Stoner, 1994; Stage, Sheppard, Davidson, & Browning, 2001) have found significant correlations between RAN-letters and later reading achievement. Rapid automatic naming of letters in kindergarten significantly predicted reading

performance in third grade, accounting for 20% of score variance on the California Achievement Test-Reading (Felton, 1992). In a study which also assessed phonological awareness, visual attention, verbal fluency (naming foods and animals), and orthographic recognition (identifying common English letter patterns) RAN-letters was the best predictor of reading (Neuhaus & Swank, 2002). Furthermore, RAN was proposed as a reading measure because it explained variance in reading achievement beyond that contributed by phonological awareness.

Although the ability to quickly and accurately identify letters appears to have implications for literacy, letter naming ability alone, like phonemic segmentation, may be insufficient for reading success. Kindergarten students instructed in letter names and letter sounds alone failed to show significant improvement in reading and spelling skills. Significant improvement was noted, however, when students were provided with explicit instruction in identifying alphabet letters along with instruction on connecting the letters to phonemic segments (Ball & Blachman, 1991).

Consistent with the previous research, Iversen and Tunmer (1993) and Hatcher, Hulme, and Ellis (1994) documented the relationship between improved phonological skills via explicit instruction and remediation of reading difficulties. The importance of phonological awareness for reading is reflected in recommendations for early reading programs. Explicit teaching of phonemic decoding skills and activities which strengthen phonemic awareness are cited as key components along with spelling, vocabulary, reading comprehension strategies, and writing (Torgesen, 2002).

### *The DIBELS*

Incorporating such research, the DIBELS assess phonological awareness, RAN, alphabetic principle, and accuracy and fluency with connected text through the following

measures: Initial Sound Fluency (ISF); Letter Naming Fluency (LNF); Phoneme Segmentation Fluency (PSF); Nonsense Word Fluency (NWF); and Oral Reading Fluency (ORF). Two additional measures, Word Use Fluency (WUF) and Retell Fluency (RTF) have recently been added to assess vocabulary and comprehension. Further research is needed, however, to determine these measures' reliability, validity, and decision-making utility (Good & Kaminski, 2002).

Initial Sound Fluency (ISF) is an indicator of phonemic awareness intended for use from the last year of preschool until the middle of kindergarten. It provides an assessment of one's ability to recognize and produce the beginning sound of an orally presented word (Good & Kaminski, 2002). For each item, students are presented with four pictures and asked to identify which picture begins with the target sound. For example, "This is mouse, flowers, pillow, letters. Mouse begins with the sound /m/. Which one begins with the sounds /fl/;" or "what sound does 'letters' begin with?" There are more than 20 alternate forms of the ISF measure.

Phoneme Segmentation Fluency (PSF) is another indicator of phonemic awareness, and requires students to accurately segment words into phonemes. Given the word "mop" for example, a correct response would be "/m/ /o/ /p/." The final score is obtained from the number of correct phonemes produced in 1 minute. PSF is generally administered from winter of kindergarten through spring of first grade.

With Letter Naming Fluency (LNF) students are given a page of upper and lower case letters and allowed 1 minute to name as many as possible. As such, LNF reflects previously discussed research correlating rapid automatic naming of letters and reading achievement. DIBELS LNF is administered from fall of kindergarten through fall of first grade.

Nonsense Word Fluency (NWF) assesses letter-sound correspondence and phonemic blending. Administered from the mid-to-end of kindergarten through the beginning of second grade, students read VC and CVC nonsense words (ex: sim, ov, lut) from a sheet of paper. The final score is the number of letter-sounds correct given 1 minute.

The relationship between Oral Reading Fluency (ORF) and reading achievement has been previously discussed. DIBELS ORF is used with students from the middle of first grade through sixth grade. Students read a passage aloud for 1 minute, during which time omitted and/or substituted words, and pauses greater than 3 seconds are marked as errors. ORF rate is the number of words correct per minute (WCM) (Good & Kaminski, 2002).

Benchmarks, or levels of performance suggestive of continued reading success, have been established for each DIBELS measure. These benchmarks are all based on a desired oral reading fluency of 40 words correct per minute (WCM) for all students by the end of first grade. Good et al. (1998, as cited in Good, Simmons, & Kame'enui, 2001) found that students in the middle 10% of a sample consistently obtained 40 WCM or higher on CBM ORF at the beginning of second grade; a reading rate associated with an adequate slope of reading progress. In comparison, students reading 10 WCM or fewer at the beginning of second grade had low or zero slopes of progress, and over time, fell increasing farther behind their peers.

Each DIBELS benchmark is related to the ORF criterion of 40 WCM. Benchmark establishment is illustrated with the DIBELS PSF. Good, Kaminski, Shinn, Bratten, Shinn, & Laimon (2001) found a positive correlation between PSF in the spring of kindergarten and spring of first grade ORF. On the scatter plot illustrating this relationship, horizontal lines were drawn at ORF score of 10 and ORF score of 40. Review of the scatter plot suggested that a majority of students scoring 35 or higher on PSF obtained the desired oral reading fluency outcome. Few of

the students scoring 10 or below on PSF, however, obtained a rate of at least 40 WCM on ORF at the end of first grade. A score of 35 was set as the kindergarten PSF benchmark. Scoring below 10 suggested a need for intensive support, as it was associated with poor reading outcomes.

Research by Elliot, Lee, and Tollefson (2001) and Hintze, Ryan, and Stoner (2003) indicates a positive relationship between the DIBELS and other measures of achievement and phonological processing. Additionally, the DIBELS possess good inter-rater and test-retest reliabilities (Elliot, Lee, & Tollefson, 2001).

### *Reading and Bilingualism*

A shortcoming of much of the research on phonological awareness and literacy acquisition is its focus on the English language and monolingual speakers. Several researchers (Cossu, Shankweiler, Liberman, & Gugliotta, 1995; Öney & Durgunoğlu, 1997; Patel, Snowling, & de Jong, 2004; Wimmer, 1993) have called for cross-cultural studies to determine the saliency of phonological awareness for literacy acquisition in languages other than English. Differences in literacy development have been noted for children learning to read shallow orthographies where grapheme-phoneme mappings are consistent and each letter has a specific sound, versus deep orthographies, such as English, where letter sounds change depending on the word or context (Cossu et al., 1995; Öney & Durgunoğlu, 1997; Patel et al., 2004; Spencer & Hanley, 2004; Tressoldi, Stella, & Faggella, 2001; Wimmer, 1993).

Research also suggests differences between monolingual and bilingual children in the areas of metalinguistic and phonological awareness. Metalinguistic awareness is defined as the ability to analyze language and manipulate its segments (Rubin & Turner, 1989). Bilingual children have been shown to separate objects and their labels, for example calling the sun

“moon” and vice versa, with greater ease than monolingual children (Cummins, 1978). They have significantly outperformed their monolingual peers on tasks requiring them to count the number of words in spoken sentences (Bialystok, 1986) and discriminate language sounds (Davine, Tucker, & Lambert, 1971). Differences have been further documented given various phonological awareness tasks. Bruck and Genesee (1995) found that French-English bilingual kindergarten students performed significantly better than monolingual, English-speaking peers on tasks assessing onset-rime awareness. Accuracy for onset deletion was 23% for monolingual students compared to 38% for bilingual students. Asked to determine if pairs of words shared the same onset, the accuracy of monolingual students was 75% for cluster onsets and 74% for singleton onsets. For bilingual students, accuracy was 84% and 80%, respectively. When re-tested in first grade, significant differences were noted for syllable counting, with the bilingual students performing better. Similar results have been reported by Rubin and Turner (1989), with English-dominant, French immersion students displaying greater accuracy on syllable and phoneme deletion tasks.

The phonological advantage for bilingual students appears to extend beyond French-English speakers. In comparisons of bilingual Italian-English and monolingual English students, the bilingual students were found to perform better on word recognition tasks, with only scores on letter identification not significantly different between the two groups (Campbell & Sais, 1995; Yelland, Pollard, & Mercuri, 1993). Spanish-English bilingual students have shown greater phoneme segmentation ability as well (Bialystok, Majumder, & Martin, 2003).

Bruck and Genesee (1995) propose that advantages in phonological awareness for bilingual students are likely related to the prominent features of the languages. Discussing the English-French bilinguals’ greater accuracy on a syllable counting task, they state that “the



syllable is more salient in French than in English...once children detect this salience, it increases their awareness of the syllable in their native language” (p. 319).

Such a theory appears to be reflected in the findings of Bialystok et al. (2003). Spanish is a language characterized by a shallow orthography. Differing from English, it is classified as a syllable-timed language (Kamii, Long, Manning, & Manning, 1987), where syllables are well-defined with clear boundaries (Jiménez, Alvarez, Estévez, & Hernández, 2000). According to Kamii et al. (1987), Spanish further contrasts with English in that many commonly used Spanish words are composed of two or more syllables while their English equivalents are monosyllabic. Yavas and Core (2001) suggest that the propensity for consonant-vowel syllables in Spanish may result in bilingual Spanish-English speakers displaying greater skill on segmentations tasks in English owing to a heightened awareness of coda consonants (syllable consonants which occur after the vowel). In their study, improved segmentation skill for Spanish-speaking children was limited words with final liquids. Performance for monolingual and bilingual students was similar when words did not contain this phonetic structure.

Contrasting with the above discussed advantages, bilingualism may also present negative confounds for the assessment of phonological awareness and reading in a second language. In the United States, children who speak Spanish at home are often taught to read in English. Phoneme awareness in English may be hindered, as children who speak Spanish as their first language are less familiar with sounds in the English language. Less familiarity with the sounds of a language may also affect the formation of associations between phonemes and their corresponding graphemes (Bruck & Genesee, 1995). In Spanish, the letters “b” and “v” are both pronounced [b]. Students may carry this pattern over to English, associating the same sound with both graphemes, unless the difference is explicitly taught. Additionally, less efficient

access to the second language may result in a slower reading rate in this language even when accurate decoding exists in both languages (Geva, Wade-Woolley, and Shany, 1997).

### *Use of the DIBELS with Bilinguals*

As previously discussed, the DIBELS provide a measure of critical pre-literacy skills. In an era characterized by increased accountability, they may be an important tool for helping to ensure literacy for all. To date, limited research indicates that the DIBELS measures are valid for bilingual and Limited English Proficient, Spanish-English students. Baker and Good's (1995) study of CBM oral reading fluency measures in English for bilingual, Hispanic students suggests that the measures are highly reliable and valid for assessing the reading skills of such students. No significant differences were found between monolingual English and bilingual students on R-CBM measures of point or level of performance. Rate of reading progress, however, was significantly different between the two groups. Bilingual students displayed a greater rate of progress than their monolingual, English peers, perhaps reflecting "systematically faster gains in second-language reading" (Baker & Good, 1995, p. 571).

Haager and Windmueller (2003) in using DIBELS to track the progress of English Language Learner (ELL), Hispanic students in the first and second grades noted an upward growth trend on all measures. Benchmarks were met later than expected, however, with students nearing the Letter Naming Fluency benchmark of 47 letters correct per minute by the middle of first grade as opposed to the end of kindergarten. Similarly, while the established benchmark for Phoneme Segmentation Fluency is 35 phonemes by the beginning of first grade, students did not reach this goal until the middle of first grade. A comparable delay was seen with Nonsense Word Fluency. The authors noted that Nonsense Word Fluency was predictive of Oral Reading Fluency. Despite meeting benchmarks for Phoneme Segmentation and Nonsense Word Fluency,

however, many students failed to meet the established Oral Reading Fluency benchmark. Based on these findings, further investigation of reading fluency expectations for ELL students was called for. It was suggested that a “fluency wall” may exist for ELLs whereby lack of fluent English knowledge limits English reading fluency despite acquisition of phonological skills.

### *Research Proposal*

The purpose of the present study is to expand the knowledge base concerning use of the DIBELS with English Language Learners. Given a limited number of studies, research in this area is incomplete. Delays in achieving phoneme segmentation benchmarks also contrast with previous research suggesting greater phonological awareness in students with knowledge of two languages. The following research questions are addressed in this study:

1. Are the DIBELS valid for documenting the reading progress of Spanish-speaking ELL students?
2. Does speaking Spanish result in greater phonological awareness as assessed by the DIBELS?
3. How does performance on the DIBELS measures relate to later reading outcomes for ELL students?
4. Do ELL students achieve DIBELS benchmarks later than monolingual, English-speaking students?

It is hypothesized that Spanish-speaking ELLs will show overall growth in early literacy skills as assessed by the DIBELS. Secondly, while knowledge of Spanish may heighten phonological awareness, less efficient access to English, the students’ second language, will result in lower scores on timed DIBELS measures, including PSF, than typically seen in monolingual, English-speaking students. In regards to performance on the DIBELS and later

reading outcomes, results of the Haager and Windmueller (2003) study suggest that NWF should be predictive of later ORF for the current sample of students. No further hypotheses regarding performance on the DIBELS and later reading outcomes for this population are made, as few studies have looked at use of the DIBELS with Spanish-speaking ELL students. Finally, less efficient access to English, and subsequent lower scores on timed DIBELS measures may result in benchmarks being achieved later than the time frame established for monolingual, English-speaking students.

## Method

### *Participants*

The participants in this study were English Language Learners in kindergarten ( $n = 86$ ) and first grade ( $n = 43$ ). All participants attended school in a rural, agricultural area of the southeast United States. Total school enrollment was approximately 500 students. The school had a high percentage of English Language Learners, with approximately 51% designated as ELLs compared to a state average of 8%. Eighty-seven percent of students were identified as Hispanic, with 66% of total students coming from migrant families. Ninety-one percent of students at this school participated in a free or reduced-price lunch program.

### *Instruments*

All participants were administered the DIBELS, with specific measures administered varying by grade-level and time within the academic year. As previously stated, the DIBELS are composed of seven measures which serve as indicators of literacy “well-being” and growth (Kaminski & Good, 1996). Tasks composing the DIBELS, as well as benchmark goals, reliability, and validity are as follows:

Initial Sounds Fluency (ISF) requires students to discriminate and produce the beginning sounds of common words. A benchmark goal of correctly identifying 25 to 35 initial sounds is established for the middle of kindergarten. Additionally, it has been suggested that students who correctly identify less than 10 initial sounds in the middle of kindergarten may require intensive support (Good & Kaminski, 2002).

ISF has been found to have good reliability and validity. According to the DIBELS manual (Good & Kaminski, 2002), alternate form reliability is .72, while repeated measures reliability is .91. The concurrent validity of ISF with the Woodcock-Johnson Psycho-educational

Battery Readiness Cluster score is .36. Predictive validity with the spring of first grade Oral Reading Fluency (ORF) and the Woodcock-Johnson Psycho-Educational Battery Total Reading Cluster score is .45 and .36, respectively.

Letter Naming Fluency (LNF) resembles a rapid automatic naming task in that students identify as many printed letters as possible given 1 minute. No benchmark goal is provided for LNF. The DIBELS authors suggest, however, that students in the lowest 20% of local norms should be considered “at-risk,” while those between the 20<sup>th</sup> and 40<sup>th</sup> percentile are considered “some risk.” Students at or above the 40<sup>th</sup> percentile of local norms are designated “low risk” suggesting that they are on target to become successful readers. The 1 month, alternate form reliability of LNF is .88. The predictive validity of LNF with the Woodcock-Johnson Psycho-Educational Battery-Revised Reading Cluster is .65 for first grade (Good & Kaminski, 2002). Predictive validity with first grade ORF is .71.

Phoneme Segmentation Fluency (PSF) assesses one’s ability to fluently segment three and four-phoneme words into their individual phonemes, or sounds. The score is the numbers of phonemes correctly produced in 1 minute. The DIBELS manual (Good & Kaminski, 2002) indicates a benchmark goal of 35 to 45 correct phonemes per minute by the spring of kindergarten and fall of first grade. Scoring below 10 phonemes correct per minute in the spring of kindergarten or fall of first grade suggests a possible need for intensive instructional support in order to obtain important preliteracy skills.

Similar to other measures composing the DIBELS, PSF has adequate reliability and validity. One week, alternate form reliability for PSF point scores is .93 (Kaminski & Good, 1996 as cited in Elliot, Lee, & Tollefson, 2001). Criterion related validity coefficients for point scores range between .43 and .65 for kindergartners. Criterion validity for the same students’

level scores ranges from .63 to .73 (Kaminski & Good, 1996). Predictive validity with spring-of-first grade CBM ORF is .62 (Good & Kaminski, 2002).

Nonsense Word Fluency (NWF) provides a measure of sound-symbol correspondence by asking students to read randomly ordered vowel-consonant (VC) and consonant-vowel-consonant (CVC) nonsense words. Students may verbally produce the individual letter sounds, or blend the sounds to produce the whole nonsense word. The score is the number of letter sounds correctly produced in 1 minute. The DIBELS authors state that because the measure is fluency based, students receive a higher score if they are phonologically recoding the word as opposed to providing isolated letter sounds (Good & Kaminski, 2002). The benchmark goal for NWF is established at the middle of first grade. Students reach this benchmark if they correctly produce 50 or more letter sounds per minute. A need for intensive support is suggested if a student in the middle of first grade obtains a score of 30 or less. The 1 month, alternate form reliability for NWF is .83 in January of first grade (Good et al., 2001). Concurrent criterion-validity with the Woodcock-Johnson Psycho-Educational Battery-Revised Readiness Cluster score for February of first grade is .59; while predictive validity with ORF in spring of first grade is .82 (Good & Kaminski, 2002).

DIBELS Oral Reading Fluency (ORF) assesses accuracy and fluency with connected text. Students are given a grade-level passage and asked to read it aloud for 1 minute. The score is the number of words read correctly within the time limit. ORF is the DIBELS component which most closely resembles traditional R-CBM fluency probes. Good and Kaminski (2002) acknowledge that the DIBELS ORF is based on the development of, and procedures for, R-CBM as described by Stan Deno and Mark Shinn (e.g. Shinn, 1989).

As ORF requires some instruction in, and fluency with, reading, it is not administered until the middle of first grade. Grade-level probes are available through sixth grade. The benchmark goal for spring of first grade is 40 words correct per minute (WCM) for the lowest performing students, with a recommended average of 60 WCM. Good and Kaminski (2002) suggest a need for intensive reading support if the score is below 10 WCM. Students must read at least 90 WCM in order to reach the spring of second grade benchmark, and 110 WCM for the spring of third grade benchmark. Test-retest reliability for ORF ranges between .92 and .97. The alternate form reliability for different passages taken from the same grade level is .89 to .94 (Good & Kaminski, 2002).

Beyond the information reported in the DIBELS manual, the reliability and validity of the DIBELS has been supported in independent studies. Elliot, Lee, and Tollefson (2001) report that inter-rater reliability coefficients range from .89 to .94, while test-retest reliability for all measures, excluding Word Use Fluency and Oral Reading Fluency, ranges from .74 to .93. Such reliability suggests that while the DIBELS should not be used for placement/program decisions, they are sufficiently reliable to be used as screening measures of early literacy skills.

Additionally, Elliot, Lee, and Tollefson (2001) report a correlation between the DIBELS and performance on the skills cluster of the Woodcock-Johnson Psycho-Educational Achievement Battery-Revised ( $r = .81$ ). The DIBELS also correlate strongly with most subtests of the Comprehensive Test of Phonological Processing (CTOPP), the greatest correlations being obtained for ISF, PSF, and CTOPP measures of phonological awareness ( $r = .60$  &  $.53$ , respectively) and memory ( $r = .46$  &  $.39$ ) (Hintze, Ryan, & Stoner, 2003).



*Procedure*

Use of the DIBELS had previously been implemented for all students within the district. In keeping with established benchmark procedures, the current sample of students was administered the DIBELS at three points during the academic year: fall, winter, and spring. All measures were administered in English by school administrators and staff who had previously been trained in administration and scoring of the DIBELS. Students were given 1 minute, timed using a stop watch, to complete each measure. Directions were generally given in English, but translated into Spanish if students lacked the language fluency needed to understand them in English.

Kindergartners were administered Initial Sounds Fluency in the fall and winter only, while they completed Letter Naming Fluency at all three points during the year. Phoneme Segmentation Fluency was administered in both the winter and spring of kindergarten, while Nonsense Word Fluency was first administered in the spring of kindergarten.

Following recommendations in the DIBELS manual, first-grade students did not complete Initial Sounds Fluency. Letter Naming Fluency was administered to first-graders during the fall only. Measures of Phoneme Segmentation Fluency were obtained at all three points during the first grade year, as were measures of Nonsense Word Fluency. Oral Reading Fluency was administered in winter and spring of first grade.

*Data Analysis*

All data analysis was completed using the SPSS software program. Mean performance on the DIBELS, as well as the standard deviation of scores, was determined by calculating descriptive statistics for each DIBELS measure at each administration point within a grade level.

These statistics also allowed for descriptive analysis of trends in scores, suggestive of growth in pre-literacy skills over time.

Bivariate Pearson Product Moment Correlation was then used to describe the strength of relationships among each of the DIBELS measures. A series of step-wise regressions were also run to address the research question as to how performance on the DIBELS was predictive of later reading outcomes for Spanish-speaking ELL students.

Finally, the utility of established DIBELS benchmarks for this population was investigated using scatterplots and cutoff scores. Scatterplots of performance on one DIBELS benchmark with performance on the subsequent DIBELS benchmark were created. Established cutoff scores indicative of benchmark attainment or a need for intensive support were marked on the scatterplots and percentages of students who met both benchmarks, met one benchmark, but failed to reach the subsequent benchmark, or obtained scores suggestive of a need for intensive support across both measures, were calculated.

## Results

Descriptive statistics for each DIBELS measure according to student grade level and administration time (fall, winter, or spring) are summarized in Tables 1 and 2. The number of kindergarten students completing each measure, as well as their means and standard deviations by administration time, are reported in Table 1. Similar data for first grade students is reported in Table 2. Overall, scores appeared to increase over the year, demonstrating a growth in early literacy skills from fall to winter, and from winter to spring.

Table 1

*Mean DIBELS Scores for ELL Kindergartners*

	Benchmark 1 - Fall			Benchmark 2 Winter			Benchmark 3 - Spring		
	n	Mean	SD	n	Mean	SD	n	Mean	SD
Initial Sound Fluency	79	7.99	6.94	78	17.60	9.06	----	----	----
Letter Naming Fluency	79	17.87	12.61	80	40.83	14.67	80	47.50	16.53
Phoneme Segmentation Fluency	----	----	----	80	25.43	12.55	80	45.43	11.75
Nonsense Word Fluency	----	----	----	----	----	----	85	44.15	11.75

Table 2

*Mean DIBELS Scores for ELL First Graders*

	Benchmark 1 Fall			Benchmark 2 Winter			Benchmark 3 - Spring		
	n	Mean	SD	n	Mean	SD	n	Mean	SD
Letter Naming Fluency	36	44.72	14.11	----	----	----	----	----	----
Phoneme Segmentation Fluency	36	39.78	13.93	40	46.95	17.25	40	49.80	8.76
Nonsense Word Fluency	36	40.06	17.60	40	52.68	24.51	43	63.72	24.03
Oral Reading Fluency	----	----	----	40	31.40	18.78	43	57.67	25.62

In fall of kindergarten, the mean performance on ISF was 7.99 initial sounds correct per minute. Individual scores were classified so that scores less than 4 were “at-risk” for later reading difficulty, while scores between 4 and 7 indicated “some risk.” Scores of 8 or greater suggested “low risk” of difficulty. Kindergartners’ performance on the DIBELS according to risk category is presented in Table 3. The distribution of fall of kindergarten ISF scores was positively skewed, indicating that more students obtained low scores on this measure. Of the 79 kindergartners completing ISF in the fall, 27 (34%) obtained an “at-risk” score, with 8 kindergartners failing to identify any initial sounds. An additional 17 students (22%) had scores indicating “some risk.” Less than half of the kindergartners (35 students, 44%) had fall ISF scores suggestive of low risk for later reading difficulty.

By winter, the average kindergarten ISF performance had increased to 17.60 initial sounds correct. Scores of 9 or less were now classified as “at-risk,” while scores between 10 and 24 suggested “some risk” for reading difficulty. Scores of 25 or greater were classified as “low risk.” Of 78 students completing winter of kindergarten ISF, 13 (17%) obtained “at-risk” scores, 49 (63%) obtained “some risk” scores, and 16 (21%) obtained “low risk” scores. Nineteen of the 27 students deemed “at-risk” in the fall had progressed, now demonstrating “some risk” for literacy acquisition, while 7 remained “at-risk.” Only 1 student progressed from “at-risk” in fall to “low risk” in winter. Among the 17 students deemed “some risk” in fall, none progressed to “low risk,” and 13 remained in the “some risk” group in winter. Winter ISF results were variable for students obtaining “low risk” ISF scores in fall. Fifteen of these students obtained “low risk” scores in winter, while another 17 students fell in the “some risk” range. Despite evidence of growth, only 16 students, or 21% of kindergartners, reached the benchmark of at least 25 initial sounds correct by the middle of the year.

Table 3

*Percentage of Kindergartners by DIBELS Classification*

	Benchmark 1 - Fall			Benchmark 2 - Winter			Benchmark 3 - Spring		
	At-Risk	Some Risk	Low Risk	At-Risk	Some Risk	Low Risk	At-Risk	Some Risk	Low Risk
Initial Sound Fluency	34.18	21.52	44.30	16.67	62.82	20.51	----	----	----
Letter Naming Fluency	11.39	10.13	78.48	1.25	13.75	85.00	7.50	26.25	66.25
Phoneme Segmentation Fluency				10.00	16.25	73.75	0	15.00	85.00
Nonsense Word Fluency							7.06	5.88	87.06

The sample of kindergartners demonstrated greater success on measures of LNF. In fall, kindergartners obtained an average LNF score of 17.87 letters correct per minute. Scores had the following classifications: 0-1 “at risk,” 2-7 “some risk,” and 8 or more “low-risk.” Overall, 78% of the kindergarten sample, or 62 students, obtained a “low risk” score when this measure was given in fall. Eight kindergartners (10%) demonstrated “some risk,” while 9 (11%) were “at-risk.” Thirty kindergartners deemed “at-risk” or “some risk” based on the fall ISF benchmark scored in the “low risk” range on LNF. This equated to 38% of kindergartners who performed poorly on ISF but within acceptable limits on LNF during the fall.

By winter of kindergarten, average LNF increased to 40.83 letters per minute. Scores between 0 and 14 were “at-risk,” while scores from 15 to 26 suggested “some risk.” Scores of 27 or greater were “low risk.” More students continued to perform in the “low risk” range on LNF as compared to ISF. Additionally, the number of students “at-risk” decreased, with more students now deemed “some risk” or “low risk.” Of the 80 kindergartners completing LNF in the winter, 68 (85%) scored in the “low risk” range for later reading difficulty. Eleven kindergartners (14%) were in the “some risk” range, while 1 kindergartner (1%) was in the “at-risk” range. Seven students designated “low risk” on fall LNF were “some risk” on LNF in winter. No students moved from “low risk” to “at-risk.” Among the kindergartners who made progress on this measure, 5 moved from “some risk” to “low risk,” and 5 progressed from “at-risk” to “low risk.” Two students who had “at-risk” LNF scores in fall obtained “some risk” LNF scores in winter.

Continued growth in LNF occurred between the winter and spring of kindergarten benchmarks, with the kindergartners increasing their LNF to an average of 47.50 letters correct per minute in spring. Spring LNF scores were classified as follows: 0-28 “at-risk,” 29-39 “some

risk,” and 40 or greater “low risk.” Fifty-three of the 80 students (66%) obtained a “low risk” score on spring LNF. Twenty-one students (26%) scored in the “some risk” range and 6 students (8%) scored in the “at-risk” range.

The performance of the kindergartners on the spring LNF benchmark was similar to that of the first graders in the fall. Given the fall LNF benchmark, first-graders obtained an average score of 44.72 letters correct per minute. Twenty-nine of 36 first graders (81%) performed within the “low risk” range, while 3 (8%) fell in the “some risk” range. Four first grade students (11%) were in the “at-risk” range based on their fall LNF scores (see Table 4).

Both kindergartners and first-graders demonstrated growth over time on measures of phoneme segmentation fluency (PSF). For kindergartners first completing PSF as part of the DIBELS winter benchmark assessment, average performance was 25.43 phonemes correct per minute. Scores of 6 or less on winter of kindergarten PSF were classified as “at-risk” for later literacy success, while scores between 7 and 17 indicated “some risk.” Scores of 18 or greater suggested “low risk.” A majority of kindergartners fell in the “low risk” range. Fifty-nine of the 80 kindergartners (74%) obtained “low risk” winter PSF scores. Thirteen kindergartners (16%) obtained “some risk” scores, while 8 (10%) obtained “at-risk” scores.

Average PSF performance increased to 45.43 phonemes correct per minute in spring of kindergarten. The number of kindergartners displaying adequate phoneme segmentation skills in the spring also increased. Scores were classified as follows: 0-9 “at-risk,” 10-34 “some risk,” and 35 or greater “low risk.” Of the 80 kindergartners completing PSF in the spring, 68 (85%) had “low risk” scores, 12 (15%) had “some risk” scores, and none had “at-risk” scores. With the exception of 2 students, kindergartners who were “low risk” in winter remained so in spring.



Table 4

*Percentage of First Graders by DIBELS Classification*

	Benchmark 1 Fall			Benchmark 2 - Winter			Benchmark 3 - Spring		
	At-Risk	Some Risk	Low Risk	At-Risk	Some Risk	Low Risk	At-Risk	Some Risk	Low Risk
Letter Naming Fluency	11.11	8.33	80.00	----	----	----	----	----	----
Phoneme Segmentation Fluency	5.56	30.56	63.89	7.50	7.50	85.00	0	0	100.00
Nonsense Word Fluency	5.56	8.33	86.11	12.50	40.00	47.50	4.65	34.88	60.47
Oral Reading Fluency				50.00	40.00	10.00	18.60	27.91	53.49

Among kindergartners who were “at-risk” on winter PSF, 4 each moved to “low risk” and “some risk” on spring PSF. Seven students who were in the “some risk” range on winter PSF also progressed to the “low risk” range on spring PSF.

Similar to the kindergartners, first graders displayed progress on PSF with average scores increasing from 39.78 to 46.95 and finally 49.80 phonemes correct per minute across the fall, winter, and spring DIBELS benchmarks. Score classifications were consistent at all three administration points. Scores of 9 or less indicated “at risk” or “deficit” skills, while scores between 10 and 34 suggested “some risk” or “emerging” phoneme segmentation skills. Students obtaining scores of 35 or greater were “low risk” or had “established” phoneme segmentation skills. A majority of first graders at all three administration points fell in the established range. In fall, 23 of 36 first graders (64%) obtained “established” PSF scores, while 11 (31%) obtained “emerging” scores. Only 2 first graders (6%) demonstrated “deficit” skills, obtaining scores of 9 or less on fall PSF.

By winter of first grade, the percentage of students displaying “established” phoneme segmentations skills had increased to 85% (34 of 40 students). Three students (8%) had “emerging” skills, and 3 (8%) had “deficit” skills. Ten first graders moved from “emerging” PSF scores in fall, to “established” PSF scores in winter. Results were mixed for the 2 first graders earning “deficit” PSF scores in fall. One student made progress, moving into the “emerging” range, while the other obtained the same score as in fall. No changes in score classification occurred among students with “established” skills in fall.

Continued progress with phoneme segmentation skills resulted in all first graders obtaining “established” scores on the spring PSF assessment. Furthermore, although phoneme segmentation skills continued to improve from fall to winter and winter to spring, data show that

overall ELL students reached PSF benchmarks within the timeframe established for English-dominant students. This stands in contrast to ISF where few of the kindergartners were able to reach the benchmark.

The established benchmark for NWF is 50 correct sounds per minute by the middle of first grade. For kindergartners first completing this measure in spring, 25 correct sounds per minute has further been established as a benchmark suggesting emerging literacy success. In the spring, the sample of kindergartners was close to achieving the first grade benchmark, obtaining a mean NWF score of 44 correct sounds per minute. Of the 85 kindergartners completing NWF, 74 (87%) obtained a “low risk” score, naming at least 25 sounds correctly given 1 minute. Five kindergartners (6%) correctly identified between 16 and 24 sounds, thus falling in the “some risk” range. Another 6 kindergartners (7%) scored in the “at-risk” range identifying 15 or fewer sounds correctly.

The performance of the first graders in the fall was somewhat lower than that of the kindergartners in spring. The average fall NWF score for first graders was 40 correct sounds per minute. Two students (6%) scored in the “at-risk” range, identifying 12 or fewer sounds correctly. Another 3 students fell in the “some risk” range, identifying 13 to 23 sounds. A majority of first graders (31 students, 86%) scored in the “low risk” range correctly identifying at least 24 sounds.

First graders’ skill increased steadily throughout the fall and winter, evidenced by the increase in NWF benchmark scores. Overall, first graders reached the NWF benchmark on time, producing an average of 52.68 correct sounds per minute during the winter assessment. Although first graders met the winter NWF benchmark, a large standard deviation of 24.51 sounds/minute existed for winter of first grade NWF. Investigation of data on a case by case

basis suggested that the NWF mean did not reflect the 21 students (53% of the sample) who failed to achieve the NWF benchmark by winter of first grade. Of these 21 students, 16 (40%) obtained “emerging” scores, and 5 (13%) obtained “deficit” scores. Furthermore, while NWF increased to an average of 63.72 sounds correct per minute by spring of first grade, a significant portion of the first graders had yet to reach the NWF benchmark by spring. In all, 17 of 43 first graders, or 40%, were identifying fewer than 50 sounds per minute correctly during the spring. Inconsistent performance on this measure was also noted among the students. Fifteen first graders (42%) demonstrating adequate performance on NWF in the fall failed to meet the benchmark when assessed during the winter. Seven of these students (19%) were subsequently able to meet the benchmark by the time of the spring assessment.

Similar to LNF and PSF, students had greater success obtaining fluent oral reading skills. Success with oral reading, however, was not apparent from initial ORF scores. First graders completing ORF for the first time in winter read an average of 31.40 words correct per minute (WCM). A score of 29 or fewer WCM was considered “at-risk,” while scores of 30 to 54 WCM were “some risk.” “Low risk” was suggested by scores of at least 55 WCM. Of 40 first graders, 20 (50%) obtained “at-risk” scores in winter. Another 16 first graders (40%) scored in the “some risk” range, while 4 (10%) scored in the “low risk” range.

ORF improved greatly from winter to spring. By spring of first grade, students read an average of 57.67 WCM, surpassing the established benchmark for all students of 40 WCM. In fact, 32 of the 43 first-graders (74%) met the benchmark of 40 WCM, obtaining ORF scores suggestive of continued reading success. Twenty-three of the 43 first graders (53%) further obtained the higher recommended average of 60 WCM.

*Relationships Among DIBELS Measures*

In order to determine the relationships between the DIBELS measures across administrations, Pearson product-moment correlations were run. Results by grade level are presented in Tables 5 and 6.

With the exception of winter NWF, previous performance on a measure correlated most strongly with subsequent performance on that measure, suggesting that the DIBELS are reliable for documenting the reading progress of ELL students. For kindergartners, all correlations were positive. A majority were also significant, with many significant at the 0.01 level. The correlations which failed to reach significance for kindergarten students were between fall ISF and spring PSF ( $r = .131$ ,  $p = .253$ ) and between winter LNF and spring PSF ( $r = .218$ ,  $p = .052$ ).

Among first graders, more variability in the significance of correlations existed. LNF was not significantly related to PSF at any point or with NWF in the spring ( $r = .087$ ,  $p = .612$ ). While fall PSF was significantly correlated with subsequent performance on ORF, winter and spring PSF were not. Unlike the kindergarten sample, significant correlations were also not found between PSF and NWF. First graders' performance on NWF, however, was found to significantly correlate at the 0.01 level with later performance on ORF.

Table 5

*Correlations Between DIBELS Measures for Kindergartners*

	ISF - Fall	ISF Winter	LNF Fall	LNF Winter	LNF Spring	PSF Winter	PSF - Spring	NWF Spring
ISF Fall	1	.546**	.425**	.261*	.315**	.433**	.131	.367**
ISF Winter	.546**	1	.389**	.446**	.384**	.437**	.269*	.488**
LNF Fall	.425**	.389**	1	.487**	.470**	.484**	.358**	.478**
LNF Winter	.261*	.446**	.487**	1	.770**	.361**	.218	.703**
LNF - Spring	.315**	.384**	.470**	.770**	1	.351**	.304**	.755**
PSF Winter	.433**	.437**	.484**	.361**	.351**	1	.583**	.410**
PSF - Spring	.131	.269*	.358**	.218	.304**	.583**	1	.453**
NWF - Spring	.367**	.488**	.478**	.703**	.755**	.410**	.453**	1

\*\* Correlations significant at the 0.01 level. \* Correlations significant at the 0.05 level.

Table 6

*Correlations Between DIBELS Measures for First Graders*

	LNF - Fall	PSF Fall	PSF - Winter	PSF - Spring	NWF - Fall	NWF Winter	NWF - Spring	ORF - Winter	ORF - Spring
LNF Fall	1	.029	-.118	-.071	.402*	.376*	.087	.423*	.335*
PSF Fall	.029	1	.662**	.509**	.195	.235	.280	.366*	.408*
PSF Winter	-.118	.662**	1	.579**	.129	.086	.164	.147	.090
PSF - Spring	-.071	.509**	.579**	1	-.164	.003	.066	.022	.088
NWF - Fall	.402*	.195	.129	-.164	1	.728**	.568**	.723**	.577**
NWF - Winter	.376*	.235	.086	.003	.728**	1	.542**	.790**	.604**
NWF - Spring	.087	.280	.164	.066	.568**	.542**	1	.626**	.679**
ORF - Winter	.423*	.366*	.147	.022	.723**	.790**	.626**	1	.862**
ORF - Spring	.335*	.408*	.090	.088	.577**	.604**	.679**	.862**	1

\*\* Correlations significant at the 0.01 level. \* Correlations significant at the 0.05 level.

To determine which DIBELS measures significantly predict later literacy outcomes for Spanish-speaking ELL students a series of step-wise regressions was run. For each criterion measure of interest, a regression was run using previously administered DIBELS measures as the predictor variables. Prior administrations of the same DIBELS measure, for example winter NWF when the criterion was spring NWF, were dropped from the analyses as they are essentially alternate forms of the same measure and would account for the majority of the variance. Concurrent measures, that is, other DIBELS measures administered at the same time as the criterion, were also dropped as the focus was predictive utility of the DIBELS.

For kindergartners, the degree to which both fall and winter DIBELS measures predicted performance on NWF in the spring of kindergarten was explored. When fall ISF and fall LNF were entered as predictor variables, fall LNF emerged as the single best predictor of spring NWF, accounting for 23% of the variance (see Table 7). Among DIBELS measures administered in the winter of kindergarten, LNF and ISF were significant predictors of spring NWF (see Table 8). Winter LNF scores accounted for 50% of the variance in spring of kindergarten NWF scores, while winter ISF scores accounted for an additional 4% of the variance. Phoneme segmentation skills in the winter of kindergarten did not significantly predict later performance on NWF.

A third regression was run to determine which DIBELS measures administered in the winter best predicted spring of kindergarten performance on PSF. Results are presented in Table 9. Given winter ISF and winter LNF as the predictor variables, winter ISF was significant, accounting for 7% of the variance in spring PSF scores.

Table 7

*Fall Predictors of Spring NWF for Kindergartners*

	R	R Square Change	F	Sig.	Beta	t
LNF Fall	.478	.229	22.56	.000	.478	4.75

Table 8

*Winter Predictors of Spring NWF for Kindergartners*

	R	R Square Change	F <sup>1</sup>	Sig.	Beta <sup>2</sup>	t
LNF Winter	.703	.495	76.40	.000	.606	7.04
ISF Winter	.733	.042	44.58	.000	.227	2.64

*Note:* 1 = F-value and significance for models with subsequent predictors; 2 = Beta for each predictor in final model plus t-value

Table 9

*Winter Predictors of Spring PSF for Kindergartners*

	R	R Square Change	F	Sig.	Beta	t
ISF Winter	.269	.072	6.07	.016	.269	2.46



Three step-wise regressions investigating the predictive utility of the DIBELS were also run with the first grade sample. The first regression sought to determine which DIBELS measures administered in the fall of first grade significantly predicted winter of first grade NWF scores (see Table 10). When winter NWF was the criterion, fall LNF was a significant predictor, accounting for 14 percent of the variance. Fall PSF did not contribute significantly to the explained variance and was excluded from the model.

The two remaining regressions investigated which of the DIBELS measures administered in the fall and winter of first grade significantly predicted ORF in the spring of first grade. Results are presented in Tables 11 and 12. Among fall DIBELS measures NWF and PSF were significant, explaining 33% and 9% respectively, of the observed variance in Spring ORF. By winter of first grade, however, PSF performance was no longer a significant predictor of ORF in the spring. Among winter measures, NWF was the only significant predictor, explaining 37% of the variance in first graders' spring ORF scores.

Table 10

*Fall Predictors of Winter NWF for First Graders*

		R	R Square Change	F	Sig.	Beta	t
LNF	Fall	.376	.141	5.43	.026	.376	2.33

Table 11

*Fall Predictors of Spring ORF for First Graders*

		R	R Square Change	F <sup>1</sup>	Sig.	Beta <sup>2</sup>	t
NWF	Fall	.577	.333	16.99	.000	.517	3.84
PSF	Fall	.651	.091	12.14	.000	.307	2.28

*Note.* 1 = F-value and significance for models with subsequent predictors; 2 = Beta for each predictor in final model plus t-value

Table 12

*Winter Predictors of Spring ORF for First Graders*

		R	R Square Change	F	Sig.	Beta	t
NWF	Winter	.604	.365	21.81	.000	.604	4.67

*Utility of the DIBELS ISF Goal*

In addition to determining which DIBELS measures best predict subsequent performance for a sample of Hispanic ELLs, the purpose of this study was to investigate the utility of established DIBELS benchmarks for students who speak Spanish as a first language. The purpose of establishing a benchmark is to indicate a level of performance where students have favorable odds of attaining subsequent goals (Good, Simmons, & Kame'enui, 2001). The relationship between ISF in the winter of kindergarten and PSF in the spring of kindergarten is shown in Figure 1. As can be seen, a positive relationship existed between these two measures ( $r = .27$ ,  $p < .05$ ), such that kindergartners who scored higher on ISF in the winter also tended to score higher on PSF in the spring.

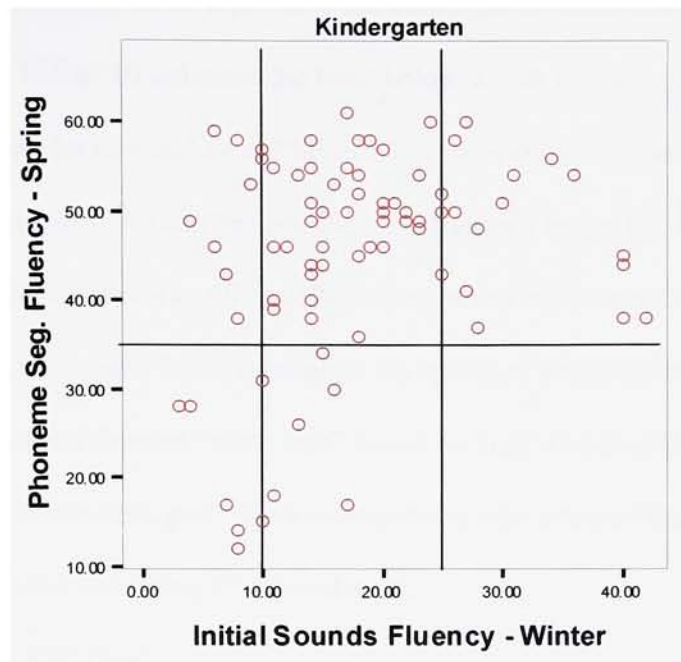


Figure 1. Relationship between ISF and PSF

The vertical line at winter ISF of 25 represents the kindergarten benchmark goal, while the vertical line at winter ISF of 10 indicates the level below which intensive remediation may be required. Likewise, the horizontal line at PSF of 35 in the spring indicates the kindergarten benchmark for this measure. As can be seen from the figure, a majority of kindergartners reached the spring PSF benchmark. Of the 12 kindergartners who scored below 10 on the winter of kindergarten ISF benchmark, 7 (58%) attained the spring of kindergarten PSF goal. A majority (86%) of students deemed “some risk” based on their winter of kindergarten ISF scores also reached the PSF benchmark goal. No kindergartners who attained the winter ISF benchmark failed to reach the spring PSF benchmark.

#### *Utility of the DIBELS PSF Goal*

The linkage between fall of first grade PSF and winter of first grade NWF is illustrated in Figure 2. Pearson correlations indicated that the relationship between these two measures was not significant for the current sample of students ( $r = .24$ ,  $p > .05$ ).

The vertical line at 35 for fall PSF indicates the benchmark for this measure. The vertical line at fall PSF of 10 suggests the point below which intensive instructional support will most likely be needed to attain subsequent reading goals.

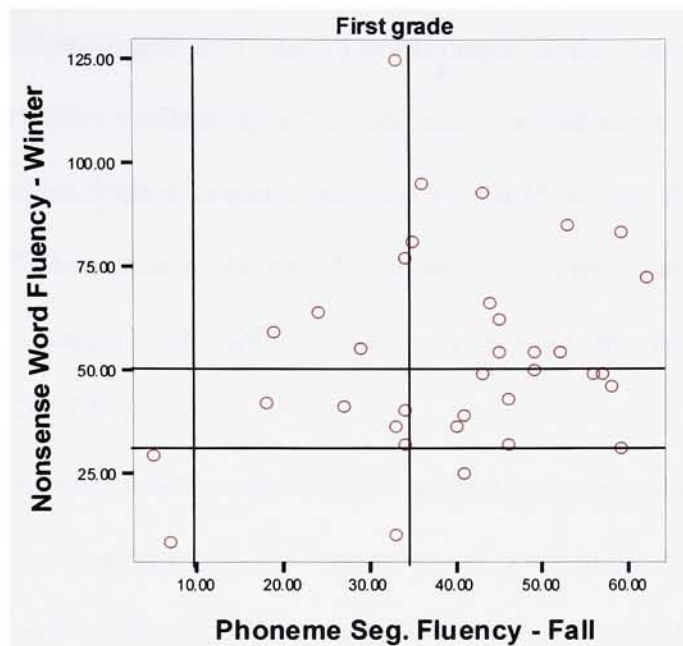


Figure 2. Relationship between PSF and NWF

In the fall, 22 first graders met the PSF benchmark goal. Eleven of these students (55%) later attained the NWF benchmark of at least 50 words correct in the winter of first grade. Likewise, the outcomes for students falling in the “at-risk” range on PSF in the fall of first grade were unclear. Of the 11 students who scored between 10 and 35 on PSF, 5 (45%) attained the winter of first grade NWF benchmark. Another 5 of these students remained “some risk” (between 30 and 50 words correct) on NWF, while 1 fell at the level where intensive support is likely needed.

#### *Utility of the DIBELS NWF Goal*

The relationship between winter of first grade NWF and spring of first grade ORF ( $r = .60, p < .01$ ) is shown in Figure 3. The benchmark for NWF in the winter of kindergarten is indicated by the vertical line at 50. The line at 30 for NWF indicates the point below which intensive support is likely needed to attain later reading goals.

Nineteen first graders reached the NWF benchmark, and of these 16 (84%) achieved the subsequent DIBELS ORF benchmark of 40 or more words correct per minute in spring of first grade. Forty percent of students, or 2 out of 5, who scored below 30 on NWF in the winter of first grade, managed to attain the ORF benchmark in spring of first grade. A high percentage (81%) of first graders who scored between 30 and 50 on NWF in the fall also obtained the spring ORF benchmark. Overall, the Pearson correlation between winter NWF and spring ORF indicated a positive relationship, such that higher scores on NWF were associated with higher scores on ORF.

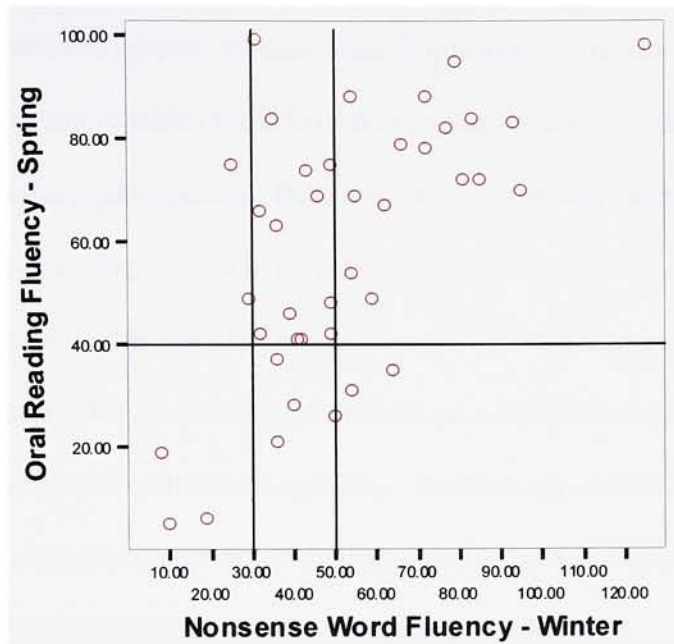


Figure 3. Relationship between NWF and ORF



## Discussion

The current study posed several research questions. The first question which it sought to answer was the extent to which the DIBELS are valid for documenting the reading progress in English of Spanish-speaking ELLs. Data from the current study support the validity of the DIBELS for documenting growth in early literacy skills among this population. Students showed increases in scores from fall to winter and from winter to spring. Additionally, with the exception of winter NWF, previous performance on a DIBELS measure best explained subsequent performance on the same measure. Students who scored in the ‘at-risk’ and ‘some risk’ ranges on a measure generally struggled to reach the benchmark for that measure, while students at ‘low risk’ continued to show adequate progress.

Different correlation patterns were noted for kindergartners and first graders. Among kindergartners, most correlations between DIBELS measures were significant. By first grade, however, the number of significant correlations had decreased greatly. This change in correlation patterns may be due to a ceiling effect on the DIBELS. As students get older and progress in school, performance on the DIBELS tends to level off, with performance on more basic skills such as ISF and LNF leveling off before performance on more advanced skills, such as NWF. Such leveling off may explain why LNF was significantly correlated with PSF and NWF at the 0.01 level among kindergartners, while among first graders fall LNF was not correlated with PSF or spring NWF and correlated with fall and winter NWF at the 0.05 level. It may also partially explain why fall PSF performance accounted for 9% of the variance in first graders’ spring ORF scores, while winter PSF performance was not a significant predictor of spring ORF.

The second question of interest was if speaking Spanish results in greater phonological awareness as assessed by the DIBELS. Based on previous research indicating greater skill on phoneme segmentation tasks among Spanish-English bilinguals, it was hypothesized that the current sample of ELLs would perform better on PSF as compared to other DIBELS measures. A majority of kindergartners and first graders did meet the PSF benchmarks. Among the kindergartners, more students showed adequate performance on PSF as compared to ISF and LNF. The DIBELS measure with the most kindergartners displaying “low risk” scores, however, was NWF. Among the first graders, more students reached established benchmarks on PSF (64%) than on NWF (48%) or ORF (53%). Only performance on LNF was better than that on PSF for the first graders, with 81% of students reaching the LNF benchmark. While this study lacked a control group of monolingual English-speakers against which the performance of the ELL students could be compared, performance on PSF appears consistent with past research (Bialystock et al., 2003; Yavas & Core, 2001). Students displayed greater facility on a task requiring phoneme segmentation as compared to most of the remaining DIBELS skills. Additionally, for the current sample of students, performance on PSF was not significantly correlated with performance on the subsequent DIBELS measure. In this study, the positive correlation ( $r = .38$ ,  $p < .001$ ) reported by Good, Simmons, and Kame’enui (2001) between spring of kindergarten PSF and winter of first grade NWF was not observed. Although the current study differed from that of Good et al. in that it looked at the correlation between PSF and NWF within a grade level (fall of first grade PSF and winter of first grade NWF), only half of the students who met the PSF benchmark later attained the NWF benchmark. This lack of correlation suggests that PSF may not be a useful predictor of future literacy success for ELL students.

The current study further provided information about the predictive utility of the DIBELS for Spanish-speaking students learning to read in English. Performance on LNF was important for both kindergartners and first graders. Among DIBELS measures administered in the fall of kindergarten, LNF was a significant predictor of performance on NWF in the spring of kindergarten. In winter of kindergarten, LNF continued to be the best predictor of spring NWF, accounting for approximately 50% of the variance. Similar findings were obtained for first graders, with fall LNF scores being a significant predictor of winter NWF scores.

For the current sample of students, ISF in the winter of kindergarten was also significant, contributing 3% to the variance in spring of kindergarten NWF scores. It should be noted, however, that students performed poorer on ISF than on other DIBELS measures. While the ISF benchmark will be discussed later, students' poorer performance on this measure, especially at the fall administration point, may be reflective of their status as English Language Learners and limited knowledge of English sounds and words upon entering school. As suggested by Geva et al. (1997), second language learners may have difficulty with phonemes that differ from those in their first language. Additionally, ISF requires students to remember four picture words at a time in order to complete tasks. The extent to which knowledge of the words in Spanish, and/or lack of familiarity with their English equivalents, interferes with performance on this measure is unknown. For example, ISF presents the pictures "jail" and "cub" together and asks students to identify the picture that begins with /k/. In Spanish, however, the word for "jail" is "cárcel" which also begins with the /k/ sound. If a student is thinking in Spanish and translating to English, or fails to remember the English words, the wrong picture may be identified.

Results of the current study do not suggest that ISF should be disregarded for Spanish-speaking ELL students. It may be advisable, however, to place more attention on the winter of

kindergarten ISF score as compared to the fall of kindergarten ISF score. Only kindergartners' winter ISF score was related to later performance on NWF. Additionally, winter ISF scores were the single significant predictors of kindergartners' performance on spring PSF.

In regards to predicting later reading outcomes, this study further suggests a role for NWF. Among first grade students, fall NWF was a significant predictor of spring ORF. By winter of first grade, it was the only significant predictor of ORF in the spring. Since fluent reading is the desired outcome for all students, ELL students' progress with nonsense words should be monitored carefully.

Overall, PSF performance appears to contribute less than other DIBELS measures, such as LNF and NWF, to later reading success. Similar to ISF, it was only predictive of later reading achievement at one administration point. Fall of first grade PSF had a significant role in spring of first grade ORF, explaining 9% of the variance. If teachers and those working with young ELLs are going to place emphasis on PSF, they should therefore be most concerned with students' phoneme segmentation abilities in the fall of first grade.

Finally, this study was conducted to determine if ELL students achieve DIBELS benchmarks later than monolingual, English-speaking students. In earlier research, Haager and Windmueller (2003), although noting an upward growth trend on all measures, found that Hispanic ELLs did not meet DIBELS benchmarks within the established timeframes. Overall, the findings of Haager and Windmueller were not supported in this study. A majority of kindergartners obtained "low risk" scores on LNF at all three administration points, with 66% of these students reaching the established LNF benchmark in spring of kindergarten. Similarly, 85% of kindergartners and 64% of first graders in the current study met the PSF benchmarks on time. For ORF, 75% of students met the spring of first grade benchmark obtaining the minimal

score of 40 WCM. Performance on NWF was less clear due to a large standard deviation. Apart from NWF, the only DIBELS measure where students had difficulty reaching the benchmark established for English-dominant students was ISF.

Such findings indicate that bilingualism may not result in significantly less efficient access to the second language (Geva et al., 1997; Haager & Windmueller, 2003). As the DIBELS are timed measures, less efficient access to English (the second language) could be expected to result in lower scores on these measures, and by extension fewer students meeting established benchmarks on time. Overall, this was not the case in the current study.

Additionally, kindergartners' previously discussed poorer performance on ISF, and overall failure to meet this benchmark, suggests that the ISF benchmark as established for English-dominant students may be too high for Spanish-speaking ELLs. It may be necessary to establish a separate benchmark which better reflects the level of ISF proficiency associated with attainment of subsequent DIBELS benchmarks for this population.

### *Implications for Theory*

Results of the current study support the use of DIBELS as a means of assessing the literacy well-being of Spanish-speaking ELLs learning to read in English. Overall, the skills assessed via the DIBELS are correlated with later literacy success for this population. The utility of benchmarks was also upheld. Consistent with past research, obtaining a benchmark was indicative of continued literacy success. Conversely, students with "at-risk" scores on one benchmark struggled on subsequent measures. The exception to this pattern was PSF, where attainment of the PSF benchmark did not correlated with attainment of the subsequent NWF benchmark. Additionally, only PSF performance in the fall of first grade was predictive of later literacy outcomes. Thus while phonological awareness and the alphabetic principle are "big

ideas” of early literacy skills (Good & Kaminski, 2003), phoneme segmentation may not be as valid a predictor of later literacy success for Spanish-English bilinguals. This is in contrast to results found for monolingual English speakers.

### *Implications for Practice*

The DIBELS can and should be used to track the development of early literacy skills for Spanish-speaking ELLs. By tracking skill growth, schools are able to discern which students are at risk for not becoming fluent readers. Knowledge of poor progress also allows for timely intervention. In order to ensure reading success for all in accordance with No Child Left Behind, early intervention is needed.

Within the area of DIBELS, PSF scores should be interpreted with caution for Spanish-speaking children learning to read in English. Overall, PSF performance does not appear to correlate strongly with performance on other DIBELS components. In determining which students need reading support, performance on LNF and NWF should be used as key indicators instead.

### *Limitations*

The current study is limited in several ways. First, pre-existing data was used. As there was not direct involvement in the collection of data, less is known about student demographics as well as data collection procedures. More control over the sample and data collection would aid in determining the degree of generalization to the larger population. Secondly, this study is limited by a lack of longitudinal data. Given only one year of data, student performance could not be compared across grade levels. Finally, the current research involved a fairly small sample, particularly at the first grade level. A small sample size also limits the generalizability of the research findings.

*Directions for Future Research*

Future investigations should seek to replicate the current study using direct collection of data. Greater information regarding student demographics will improve the generalizability of research findings. ELLs, and even Spanish-Speaking ELLs, are not a homogeneous group. Looking at student characteristics as they relate to performance on the DIBELS, will allow further determination as to which DIBELS measures correlate most strongly with later literacy outcomes for subgroups of ELLs.

Future research should also focus on obtaining longitudinal data. Unlike the Good, Simmons, and Kame'enui (2001) study, the current study could not compare student performance across grade levels. Future research should seek to determine which DIBELS measures administered in kindergarten best predict attainment of first grade ORF benchmarks for ELL students.

Obtaining similar research findings with larger groups of students will lend support to this study and improve generalizability. Therefore, future research should involve larger sample sizes than those involved in the current study.

Finally, results on ISF may have reflected confounds. The extent to which the students' first language interfered with performance on this task is not known. Consequently, more information is needed in this area. Do Spanish-speaking ELL students completing the DIBELS in English require a lower ISF benchmark? Alternately, does ISF performance reflect the students' knowledge of English vocabulary and ability to not code-switch (i.e. interchange Spanish and English terms for the same object)?

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